

Systematic Studies of Asian *Aconitum* (Ranunculaceae) IV. Description of Three New Species and One New Variety

Yuichi KADOTA

Department of Botany, National Science Museum,
Amakubo 4-1-1, Tsukuba, Ibaraki, 305-0005 JAPAN

(Received on May 8, 1999)

Three new species and one new variety of *Aconitum* are described here. *Aconitum rilongense* described from Rilong, Sichuan Prov., southwestern China is distinguished from *A. crassiflorum* in having strigose pedicels, dull yellowish flowers and longer nectary labia. *Aconitum kirghistanicum* described from the Kirghisky Mountain Range, Kirghistan, is discriminated from *A. rotundifolium* in having strigose pedicels, obovate and emarginate nectary labia and robust habit. *Aconitum iidemontanum* described from Mts. Iidesan, northern Japan, differs from *A. sanyoense* in having villose pedicels and tall cylindrical helmets. *Aconitum okuyamae* var. *wagaense* is also described from Mt. Ugo-Asahidake, northern Japan, which is different from var. *okuyamae* by erect stem, a few-flowered compact raceme and coriaceous leaves. (Continued from Natur. Environ. Sci. Res. 11: 1–6, 1998)

Key words: *Aconitum*, *Lycocotnum*, Asia, new taxa

In the course of the systematic studies of Asian *Aconitum* (Ranunculaceae) I have continued both herbarium and field examinations. Some of the results were already reported as lectotypification and observations of phenological phenomena (cf., Kadota 1995, 1996, 1997a, 1997b, 1998). Here I will describe a new species belonging to the subgenus *Lycocotnum* and two new species and a new variety of subgenus the *Aconitum*. Among them *Aconitum kirghistanicum* described below was preliminarily reported in Kadota (1996).

Subgenus ***Lycocotnum*** (DC.) Peterm.,
Deutsch. Fl. 15 (1846).

Sect. ***Lycocotnum***.

Ser. ***Crassiflora*** Tamura & Lauener
emend. Kadota.

Ser. *Crassiflora* Tamura & Lauener in

Notes Roy. Bot. Gard. Edinb. 37: 123
(1978).

Ser. *Scaposa* W.T.Wang in W.T.Wang &
Hsiao in Acta Phytotax. Sin. 12, Addit. I: 60
(1965), p. p. *minore*—Tamura, Natür.
Pflanzenfam. 17a IV: 281 (1995), p. p.
minore.

Ser. *Lycocotonia* Tamura & Lauener in
Notes Roy. Bot. Gard. Edinb. 37: 451
(1979), p. p. *minore*—Tamura, Natür.
Pflanzenfam. 17a IV: 284 (1995).

Planta perennis scaposa vel subscaposa.
Folia modice et palmatim 5–9-lobata lobis
late cuneato-obovatis laciniis acutis ovatis.
Inflorescentia racemosa multifloribus
pedicellis ascendentibus 1–2 cm longis.
Flores purpurea vel obscure flavae. Casses
cylindricae, 16–20 mm altae, ca. 10 mm
latae rostris prominentibus. Calcaria
nectariorum laminis longiora, crassa, leviter

vel valde incurvata. Semina plus minusve horizontaliter lamellata.

TYPE: *Aconitum crassiflorum* Hand.-Mazz. Endemic to southwestern China (Yunnan and Sichuan Prov.).

1. ***Aconitum rilongense*** Kadota, sp. nov.
[Figs. 1-A, 2, 3A]

Differt ab *Aconito crassifloro* pedicellis strigosis, floribus obscure flavidis et labellis nectariorum longioribus.

TYPE: CHINA; Sichuan Prov., Xiaojing Co., Rilong, the Qionglai Mountain Range, Mt. Siguniangshan, Shuangqiaoguo 3300 m, flowers dull slightly purplish yellow, under *Abies* woods, 23 August 1996, Y. Kadota 961004 (TNS 678373–holotype, TNS 675001–isotype, PE–isotype).

A subscapose perennial, 50–100 cm tall. Roots cord-like, branched and entangled, ca. 1 cm in diameter at base, rhizomatic, perennial. Stem robust, straight, erect. 6–10 mm in diameter in distal part, sparingly pilose with flexuous hairs. Basal leaves withering at anthesis. Blades of lower cauline leaves subcoriaceous, reniform in outline, yellowish green on the adaxial side, 14–25 cm wide, 14–20 cm long, medially (5–)7–9-lobed to 2–4 cm from the base; middle lobes obovato-rhombic, obtuse, 5–8.5 cm wide, 6–11 cm long, coarsely dentate; laciniae ovate to narrowly ovate, acute, 4–6 mm wide; bases deeply cordate; petioles up to 35 cm long, sparingly pilose with flexuous hairs. Inflorescence indeterminate condition, racemose, 14–16 cm long and elongated up to 30 cm long at fruiting time, rod-shaped, 15–45-flowered, bracteate; bracts foliaceous, medially trilobed. Pedicels arching inwardly, 1–1.5 cm long, densely strigose with rough-surfaced curved hairs throughout the surface, bi-bracteolate; bracteoles narrowly lanceolate, 5–8 mm long, entire, situated at the base of the pedicels. Flowers dull yellow and distally light brownish purple-colored, densely strigose with rough-surfaced curved hairs; helmets cylindrical with incurved api-

cal parts, 8–10 mm wide, 13–22 mm long, 11–14 mm high; lateral sepals roundish, 8–10 mm wide, ca. 8 mm long, villose with golden, long, straight and ascending, rough-surfaced hairs (pollen-collecting hairs) at apical parts of the adaxial side; lower sepals elliptic, obtuse, 2–5 mm wide, 6–9 mm long, shortly clawed. Nectaries glabrous, cream-colored; blades tubular, ca. 2 mm in diameter, ca. 2 mm long; labia ca. 4 mm long and longer than the blades, slightly emarginate, not reflexed; stalks almost straight, ca. 8 mm long; spurs ca. 7 mm long, slightly incurved. Stamens glabrous; staminal teeth absent. Carpels 3, glabrous or villose with smooth-surfaced ascending hairs. Follicles 12–14 mm long, provided with fine styles; seeds trigonous, ca. 3 mm long, shallowly lamellate, not alate.

In the western part of Sichuan Province (the Chuanxi region) *A. scaposum* Franch., another member of the subgen. *Lycotconum*, was quite common, however, *A. rilongense* was collected only from the Rilong area, Sichuan Province.

Differences among *A. rilongense*, *A. crassiflorum* and *A. scaposum* are as follows:

1. Flowers dull yellow; pedicels strigose with rough-surfaced curved hairs; nectary spur gently incurved

..... *A. rilongense*

1. Flowers dark purplish blue to violet or pink, sometimes yellowish white; pedicels villose with smooth-surfaced patent hairs; nectary spur intensely coiled

2. Nectary labia as long as blades; petioles not vaginate at base

..... *A. crassiflorum*

2. Nectary labia clearly shorter than blades; petioles vaginate at base

..... *A. scaposum*

Aconitum wardii Fletcher & Lauener is frequently treated as a distinct species (e.g., Wang 1965, 1979, Lauener and Tamura 1979), however, *A. wardii* is conspecific



Fig. 1. Habit of three new species and one new variety of *Aconitum*. A. *A. rilongense* Kadota (Rilong, Sichuan Prov., southwestern China). B. *A. kirghistanicum* Kadota (the Susamyr Mountains, the Kirghiskyi Range, Kirghistan). C. *A. iidemontanum* Kadota, Kita & Ueda (the Iide Range, Yamagata Pref., Japan). D. *A. okuyamae* Nakai var. *wagaense* Kadota (at the summit area of Mt. Ugo-Asahidake, Akita Pref., Japan; Y. Horii 1421, paratype). Photograph of *A. okuyamae* var. *wagaense* was taken by Mr. Yujiro Horii.

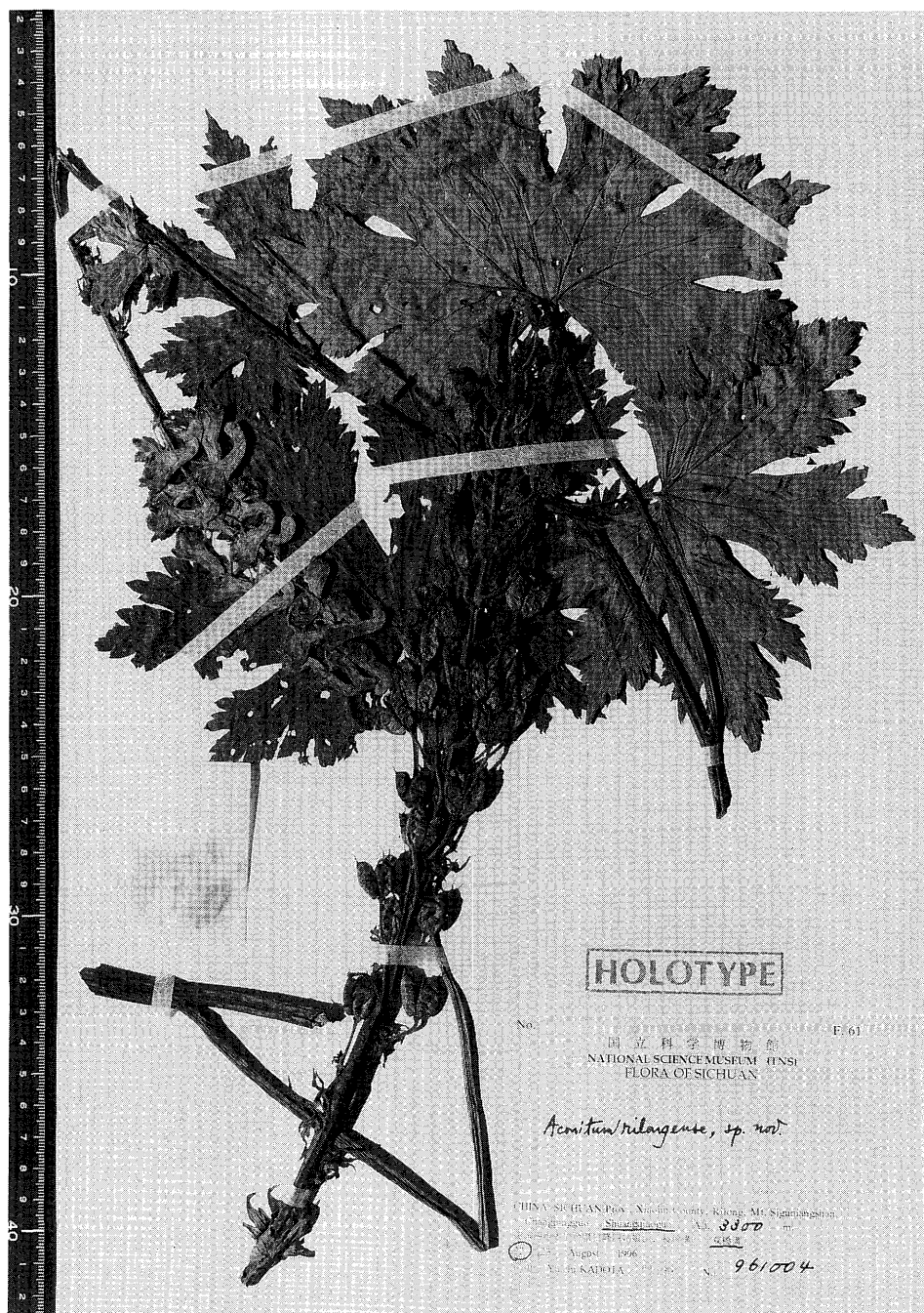


Fig. 2. Holotype of *Aconitum rilongense* Kadota (Shuangqiaoguo, Rilong, Xiaojing Co., Sichuan Prov., China, Y. Kadota 961004, TNS 678373).

with *A. crassiflorum*. The synonymy of *A. crassiflorum* is therefore given below.

Aconitum crassiflorum Hand.-Mazz., *Symb. Sin.* 7: 283, Taf. VI, Abb. 6 (1931); *Acta Hort. Gothob.* 13: 82 (1939)–Fletcher & Lauener in *Notes Roy. Bot. Gard. Edinb.* 20: 200 (1949)–W.T. Wang in *Acta Phytotax. Sin.* 12, Addit. 1: 60 (1965); *Fl. Reipubl. Pop. Sin.* 27: 165, pl. 25, fig. 7–8 (1979)–Lauener & Tamura in *Notes Roy. Bot. Gard. Edinb.* 37: 123 (1979). [Fig. 3, B–D]

TYPE: CHINA; Yunnan Prov., “auf dem Berge Schusutsu ober Böddö, 5 Aug. 1914, H. Handel-Mazzetti 4487 (WU–holotype). NW Yunnan, supra vicum Anangu (Nganantscang) ad pagi Dschungdien

(“Chungtien”), in regionis frigide temperatae lapidosis jugi Patü-la 3800–3900 m, substr. calceo, 16 Aug. 1915, H. Handel-Mazzetti 7691 (WU–paratype; PE–photograph of paratype).

Aconitum wardii Fletcher & Lauener in *Notes Roy. Bot. Gard. Edinb.* 20: 188, pl. 266, fig. 17 (1949)–W.T. Wang in *Acta Phytotax. Sin.* 12, Addit. 1: 62 (1965); *Fl. Reipubl. Pop. Sin.* 27: 168 (1979)–Lauener & Tamura in *Notes Roy. Bot. Gard. Edinb.* 37: 454 (1979), p. p., excl. *A. wardii* var. *hopeiense* et *A. leucostomum*.

CHINA; Yunnan, 1930, G. Forrest 28788 (E, PE 1274430–isoparatype; Fig. 3C).

Aconitum wardii Fletcher & Lauener f. *flavidum* Fletcher & Lauener in *Notes Roy.*

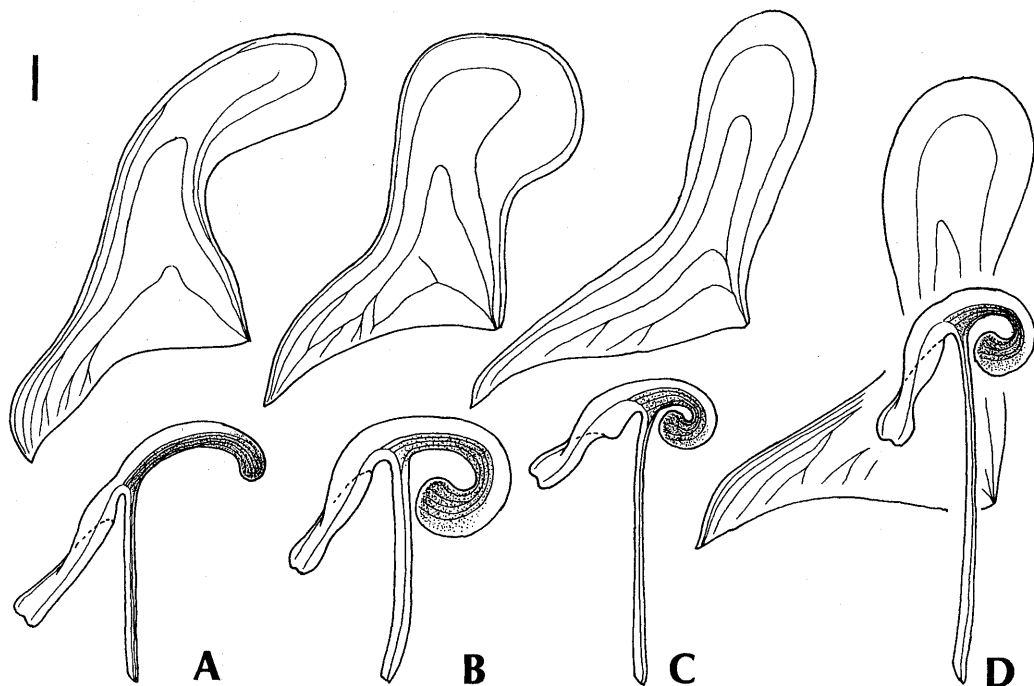


Fig. 3. Comparison between *Aconitum rilongense* Kadota and *A. crassiflorum* Hand.-Mazz. in the shape of helmets and nectaries. A. *A. rilongense* (Rilong, Sichuan Prov., southwestern China; Y. Kadota 961004, TNS 675001, isotype). B–D. *A. crassiflorum* (B, Yunnan, Zhongdian, Xiaozhongdian, Mt. Tianbaoshan 3700–3800 m, 10 Aug. 1981, Hengduan Mts. Team 2810, PE 1274716; C, Yunnan, 1930, Forrest 28789, isoparatype of *A. wardii* Fletcher & Lauener, PE 1274430; D, Yunnan, Zhongdian, Mt. Beilengshan, 14 Aug. 1937, K. M. Feng 2010, PE 298774). Scale: 2 mm.

Bot. Gard. Edinb. **20**: 188 (1949).

TYPE: CHINA; Sichuan, S. of Muli, 13000 ft., on meadow in sheltered slopes, fls. creamy yellow, 18 Aug. 1921, J. Kingdon Ward 4812 (E-holotype !; photocopy of holotype-PE 1375016 !).

Aconitum wardii Fletcher & Lauener var. *trisectum* W.T.Wang & L.Q.Li in Acta Phytotax. Sin. **25**: 24, pl. 1-1 (1987).

TYPE: CHINA; Sichuan Prov., Yajiang, Jianziwanshan, alt. 3700–3950 m, in abietetis, fl. caerulei, 6 Aug. 1983, Lang et al. 2866 (PE 1294695–holotype !).

Specimens examined: CHINA; Yunnan, Chungtien, Tapose 3100 m, 2–3 ft., leaves pale white tomentose beneath, fls. blue, 2 Aug. 1937, T. T. Yü 12581 (PE 1640904).

Chromosome number: $2n = 32$ (Yang et al. 1994).

Subgenus *Aconitum*.

Sect. *Rotundifolia* Steinb. ex Kadota, sect. nov.

Ser. *Rotundifolia* Steinb. in Kom., Fl. URSS **7**: 229 (1937), nom. nud.–W.T.Wang & Hsiao in Acta Phytotax. Sin. **12**, Addit. **1**: 96 (1965), nom. nud.–W.T.Wang, Fl. Reipub. Pop. Sin. **27**: 186 (1979), nom. nud. Neither Steinberg, W. T. Wang and Hsiao nor W. T. Wang gave Latin description to their ser. *Rotundifolia*.

Sect. *Sinaconitum* auct. non W.T.Wang: Tamura, Natür. Pflanzenfam. **17a IV**: 286 (1995), p. p. minore.

TYPE: *Aconitum rotundifolium* Kar. & Kir.

Planta pseudo-annua, scaposa vel subscaposa. Folia modice trilobata lobis mediis flabellatis laciniis late linealibus obtusis. Inflorescentia racemosa. Flores cinereo-caerulea venis atro-purpureis. Casses naviculares vel falcatae rostris brevibus. Laminae nectariorum vix evolutae calcaribus capitatis valde incurvatis. Semina trigona, laevigatae non lamellate.

Sect. *Rotundifolia* circumscribed here is

composed of three species; *A. rotundifolium*, *A. naviculare* Stapf and *A. kirghistanicum* described below.

2. *Aconitum kirghistanicum* Kadota, sp. nov. [Figs. 1-B, 4, 5-B]

Differt ab *Aconito rotundifolio* pedicellis strigosis, labellis nectariorum obovatis emarginatis et caule alto elongato.

TYPE: KIRGHISTAN; Bishkek Region, the Kirghisky Mountain Range, Susamyr Mountains, between Tyuz-Ashu Pass and Ala-Behl Pass [74°38'–73°02'E 42°48'–42°12'N] alt. 2610 m, in open pasture, 5 August 1995, Y. Kadota 9510277 (TNS–holotype, isotypes).

A herbaceous pseudo-annual, 50–90 cm tall. Tubers carrot-shaped, 5–8 mm in diameter, 3–6 cm long; rhizomes hardly distinguishable. Stem stout, erect, straight, 4–6 mm in diameter in distal part, densely strigose with rough-surfaced curved hairs throughout the surface, 4–7 times branched from distal part; branches well developed, elongated. Basal leaves present or sometimes withering at anthesis; blades deeply grayish green on the adaxial side, subcoriaceous, roundish in outline, 4–8 cm in diameter, deeply 3-lobed to 3–4 mm from the base, strigose with rough-surfaced curved hairs along veins and margin; middle lobes fan-shaped, 1.5–5 cm wide, 2.5–5 cm long, deeply pinnatisect; lateral lobes asymmetrical, broadly obovate, obtuse, 4–7.5 cm wide, 2–4 cm long, deeply divided into two segments; laciniae oblong, obtuse, 2–4 mm wide; base deeply cordate; petioles 5.5–21 cm long, sparingly strigose with rough-surfaced curved hairs. Inflorescence in determinate condition, narrowly racemose, ca. 3 cm wide, 8–13 cm long, 7–14-flowered, bracteate; bracts foliaceous, deeply 3-lobed, gradually diminishing in size from distal to proximal part, shortly petiolate to sessile. Pedicels straight, erect, 7–14 mm long, clearly shorter than flowers, densely strigose with rough-surfaced curved hairs throughout



Fig. 4. Holotype of *Aconitum kirghistanicum* Kadota (the Susamyr Mountains, the Kirghisky Range, Kirghistan, Y. Kadota 9510277, TNS).

the surface, bi-bracteolate; bracteoles spatulate to broadly lanceolate, 5–10 mm long, entire, situated above the middle of the pedicels. Flowers in July to August, pale grayish blue tinged with green color, darker purplish veined, 16–20 mm long, sparingly strigose with rough-surfaced curved hairs chiefly in distal part; helmets navicular to sickle-shaped with downward projecting short beaks and with concave lower margin, 15–20 mm wide, 8–10 mm long, 6–8 mm tall; lateral sepals distorted obovate, 7–10 mm wide, 13–18 mm long, with undulate proximal margin, devoid of pollen-collecting long hairs on the adaxial side; lower sepals elliptic, obtuse, 3–4 mm wide, 5–9 mm long. Nectaries glabrous; blades almost degenerated; labia milky-white, ligulate, ca. 2 mm long, emarginate, not reflexed; stalks slightly incurved, ca. 10 mm long; spurs capitate, abruptly bending downward. Anthers purplish black; filaments glabrous,

lacking staminal teeth. Carpels 5, densely villose with smooth-surfaced straight and ascending hairs. Follicles ellipsoidal, 7–10 mm long, with fine styles; seeds ca. 3 mm long, 3-winged, not lamellate.

Aconitum kirghistanicum is distinguished from *A. rotundifolium* by pedicel pubescence (strigose with rough-surfaced curved hairs vs. villose with smooth-surfaced patent hairs), nectary labia (ligulate and emarginate vs. deeply divided into filiform lobes) and plant size (50–90 cm vs. 15–20(–40) cm).

Kadota (1996) reported that *A. rotundifolium*, a component of Sect. *Rotundifolia*, were found to secrete no nectar based on field examination, however, *A. kirghistanicum* was not checked in the field. There is a possibility that this species does not secrete any nectar because this species has also very narrow and almost vertical openings to the spurs. It is therefore very

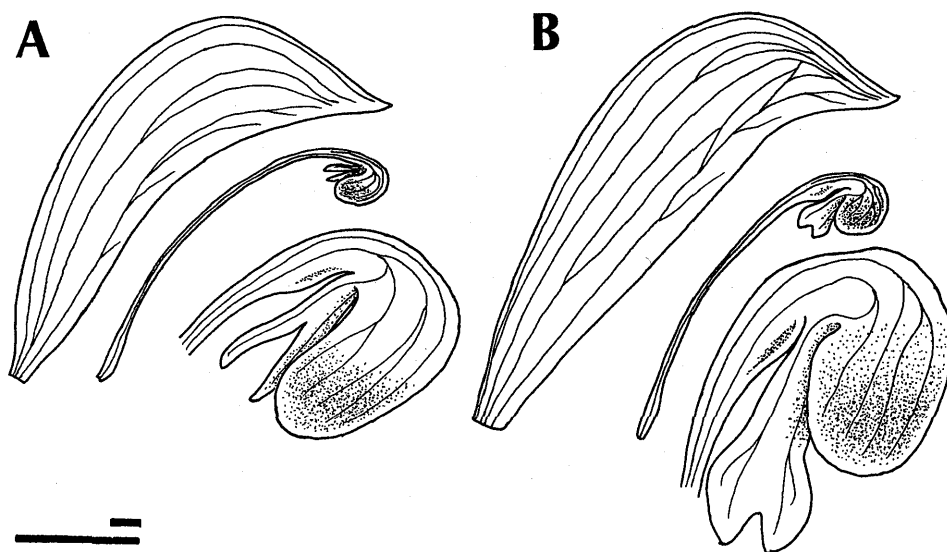


Fig. 5. Comparison between *Aconitum rotundifolium* Kar. & Kir. and *A. kirghistanicum* Kadota in the shape of helmets and nectaries. A. *A. rotundifolium* (Kirghistan, Tardy Pass, Y. Kadota 9510347, TNS). B. *A. kirghistanicum* (the Susamyr Mountains, the Kirghisky Range, Kirghistan, Y. Kadota 9510277, TNS). Scales 1 mm; short scale for helmets and nectaries and long scale for enlarged nectary spurs. After Kadota (1996).

difficult for pollinators to insert their probosci.

Aconitum kirghistanicum grows in rather xeric alpine meadow. In this habitat other two *Aconitum* species, *A. soongaricum* (Regel) Stapf and *A. karacolicum* Rapaics, were also found, however, any intermediate individuals were not recognized.

Sect. **Flagellaria** (Steinb.) Nakai in Bull. Natn. Sci. Mus., Tokyo (32): 19 (1953)–Kadota, Rev. Aconit. E. Asia 48 (1987).

Sect. **Napellus** DC. ser. **Flagellaria** Steinb. in Kom., Fl. URSS 7: 213 (1937), nom. nud.

LECTOTYPE (Nakai 1953, p. 19): *Aconitum flagellare* (F. Schmidt) Steinb. [= *A. karafutense* Miyabe & Nakai].

Ser. **Latifolia** Nakai in Bull. Natn. Sci. Mus., Tokyo (32): 48 (1953)–Kadota, Rev. Aconit. E. Asia 49 (1987).

TYPE: *Aconitum sanyoense* Nakai.

3. ***Aconitum iidemontanum*** Kadota, Kita & Ueda, sp. nov. [Figs. 1-C, 6]

Aconitum metajaponicum auct. non Nakai: Kadota in Mem. Natn. Sci. Mus., Tokyo (17): 80, figs. 2-A, 4, 5-A (1984), p. p. excl. pl. Mt. Kiso-Ontake; Rev. Aconit. E. Asia 84, fig. 27, map 8, pl. 15 (1987), p. p. excl. pl. Mt. Kiso-Ontake.

Differ ab *Aconito sanyoense* pedicelis villosis, cassibus cylindrice longe conicis et rostris cassium brevis.

TYPE: JAPAN; Honshu, Yamagata Pref., Nishi-Okitama-gun, Oguni-machi, the Iide Mountain Range, the Kajikawa Ridge, Goro Spring, alt. 1380 m, in a tall herbal stand along streamside surrounded by *Betula ermanii* and *Alnus maximowiczii* scrub, fls. purplish blue, 6 September 1995, Y. Kadota 953004 (TNS–holotype).

Japanese name: Iide-torikabuto (nov.).

A pseudo-annual, 120–200 cm tall. Tubers obovoidal, 1–3.5 cm in diameter, 5–10 cm long; rhizome ca. 5 mm long. Stem robust, declining, glabrous, 5–20 mm in diameter in distal part, usually 3–10 times

branched; branches elongated, ascending at an obtuse angle to the stem. Basal leaves withering at anthesis. Blades of middle cauline leaves green, membranous to subcoriaceous, roundish reniform in outline, 9–17 cm wide, 8–15 cm long, shallowly to medially palmately 5–9-lobed to 2.5–5 cm from the base; middle lobes obovato-rhombic, acute, 2.5–6 cm wide, 6–9 cm long, shallowly pinnately incised; laciniae ovate to broadly lanceolate, acute, 5–10 mm wide; bases cuneate to truncate or broadly cordate; petioles 4–8 cm long, sparingly strigose with rough-surfaced curved hairs. Inflorescence in determinate condition, racemose, 4–18 cm long, 1–6-flowered, bracteate; bracts foliaceous, trilobed and coarsely dentate as foliage leaves. Pedicels ascending at an acute angle to the rachis to arching inwardly, 3–6 cm long, villose with smooth-surfaced patent hairs throughout the surface, usually intermixed with smooth-surfaced patent glandular hairs in proximal part, bi-bracteolate; bracteoles narrowly lanceolate to linear, 3–5 mm long, situated below the middle of the pedicels. Flowers in August to September, purplish blue, or sometimes dark violet to pale purplish blue, 35–45 mm long, almost glabrous but sparingly villose with smooth-surfaced patent hairs and/or patent glandular hairs in distal part; helmets cylindrically conical with short projecting beaks, 15–19 mm wide, 19–27 mm long, 15–24 mm high, clearly longer than wide; lateral sepals roundish, 14–16 mm wide and long, villose with long, rough-surfaced, straight and ascending hairs (pollen-collecting hairs) on the adaxial side; lower sepals elliptic, 12–14 mm long. Nectaries glabrous, milk-white except for the proximal half of labia; blades 3–4 mm wide, 11–14 mm long, tapering to spurs and not inflated or slightly inflated; labia ovate, emarginate, 2–4 mm long, purplish blue in the proximal half, strongly reflexed; stalks 13–16 mm long, more or less inflexed; spurs long and



Fig. 6. Holotype of *Aconitum iudemontanum* Kadota, Kita & Ueda (the Iide Range, Yamagata Pref., Japan, Y. Kadota 953006, TNS).

hamately curved, coiled to nearly to 360 degrees. Stamens more or less villose with smooth-surfaced patent hairs or sometimes glabrous, with staminal teeth. Carpels 3–4, glabrous or villose with smooth-surfaced straight and ascending hairs. Follicles elliptic, 2–3 cm long, divergent, with styles 4–5 mm long; seeds trigonous, 4 mm long, lamellate across.

Chromosome number: $2n = 16$ (Kadota 1984, 1987, under the name of “*A. meta-japonicum*”).

Specimens examined: JAPAN; Honshu, Yamagata Pref., Nishi-Okutama-gun, Oguni-machi, the Iide Mountain Range, the Kajikawa Ridge, Goro Spring 1380 m, 28 August 1979, Y. Kadota 6633–6644 (TNS); Goro Spring 1380 m, 31 August 1985, Y. Kadota 12207–12246 (TNS); the Kajikawa Ridge 1300 m, 20 October 1982, Y. Kadota 9320–9330 (TNS).

Aconitum iidemontanum is discriminated from *A. sanyoense* by pedicel pubescence (villose with smooth-surfaced patent hairs vs. glabrous) and helmet shape (tall cylindrically conical with downward projecting short beaks vs. conical with long, horizontally projecting beaks). Full illustration and detailed illustrations of floral organs of *A. iidemontanum* are given in Kadota (1987, Fig. 7, p. 25; Fig. 27, B–E, p. 85; all under the name of “*A. meta-japonicum* Nakai”).

Sect. **Euchylodea** Reichb., Ueber. Gatt. Aconit. 14 (1819).

Ser. **Japonica** (Nakai) Kadota, Rev. Aconit. E. Asia 52 (1987).

Subser. **Japonica**.

Aconitum okuyamae Nakai in Bot. Mag. Tokyo 63: 56 (1950), nom. tant.; Bull. Natn. Sci. Mus., Tokyo (32): 37, no. 29 (1953)–Kadota in Mem. Natn. Sci. Mus., Tokyo (17): 81, figs. 1, 2-D, 4, 5-C (1984); Rev. Aconit. E. Asia 153, fig. 45, map 23, pl. 39 (1987).

4. Var. **wagaense** Kadota, var. nov.

[Figs. 1-D, 7]

Aconitum okuyamae auct. non Nakai: Kadota, Rev. Aconit. E. Asia 153 (1987), p. minore pl. Mt. Ugo-Asahidake.

Differt ab *Aconito okuyamae* var. *okuyamae* cauli erecto brevi, inflorescentia compactae pauciflori et foliis coriaceis.

TYPE: JAPAN; Akita Pref., Senboku-gun, Tazawako-machi, the Waga Mountain Range, Mt. Ugo-Asahidake 1250 m, in alpine meadow, 16 Aug. 1997, Y. Horii 1426 (TNS 647859–holotype, Fig. 1, D); Mt. Ugo-Asahidake 1250 m, 16 Aug. 1997, Y. Horii 1421 (TNS 647864–paratype).

Japanese name: Waga-torikabuto (nov.).

Var. *wagaense* is distinguished from *A. okuyamae* var. *okuyamae* by short and erect stem, a compact few-flowered terminal inflorescence and coriaceous leaves. *Aconitum okuyamae* var. *okuyamae* usually grows along and in summer-green woodlands and has reclining stem, a many-flowered loose raceme and membranous leaves (Kadota 1987). While *A. okuyamae* var. *wagaense* exclusively grows in herbal stands of the summit area of Mt. Ugo-Asahidake (1376 m), Akita Pref., northern Japan.

Illustrations of floral organs are given in Kadota (1987; fig. 45, B, p. 155, under the name of *A. okuyamae*).

I wish to give my sincere thanks to Drs. W. T. Wang and Q. E. Yang for valuable discussion and advise on Chinese *Aconitum*; to Mr. Y. Horii for his offers of specimens and photographs of *Aconitum okuyamae* var. *wagaense* and for the guidance to Mt. Ugo-Asahidake, Akita Pref., Japan; to Drs. I. M. Krasnoborov, A. A. Krasnikov, E. I. Wiebe, Central Siberian Botanical Garden, Academia Rossica, for arrangement to the Tien Shan Mountains Expedition in 1995; to Messieurs. L. S. Wang, Kunming Institute of Botany, Academia Sinica. and M. S. Yuan, Chengdu Institute of Biology, Academia Sinica, for arrangement to the Sichuan Mountains Expedition in 1996. My



Fig. 7. Holotype of *Aconitum okuyamae* Nakai var. *wagaense* Kadota (Mt. Ugo-Asahidake, the Waga Range, Akita Pref., Japan, Y. Horii 1426, TNS 647859).

thanks also go to the Curators of the herbaria (CAL, E, K, LE, MHA, MW, NS, PE, TI and TNS). Herbarium works were financially supported by the Delegation Programs of the Japan Society for the Promotion of Sciences (Russian Federation in 1992; the Institute of Botany, Academia Sinica, China in 1998). Field works were supported by Grants-in Aid for International Scientific Research Program (Field Research) from the Ministry of Education, Science, Sports and Culture, Japan (No. 07041152, 1995; No. 07041151, 1996).

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門田裕一: アジア産トリカブト属植物(キンポウゲ科)の分類学的研究 IV. 3 新種と 1 新変種の記載

アジア産のトリカブト属植物において、3つの新種とウゼントリカブトの1新変種を記載した。*Aconitum rilongense* は中国四川省小金県日隆から報告するレイジンソウ亜属の植物で、近縁の *A. crassifolium* からは花が上萼片や側萼片の先端部が紫色を帯びた黄色であること、花梗に屈毛が生えること、花卉の唇部が長いことで区別される。四川省・川西地区の小金県、康定県、九竜県などでは同じレイジンソウ亜属の *A. scaposum* は普通に見られたが、*A. rilongense* は小金県以外では見いだすことができなかった。*A. crassifolium* の異名を整理するとともに、*A. rilongense* と *A. crassiflorum* が所属する Ser. Crassiflora の概念を修正した。以下の3新分類群はトリカブト亜属の植物である。*A. kirghistanicum* は中央アジア、キルギスタン・キルギスキー山脈から報告する種で、近縁な *A. rotundifolium* からは花梗に屈毛が生えるこ

と、花卉の唇部が倒卵形で先端が凹むこと、全体が大型であることで区別できる。カザフスタンやキルギスタンでは *A. rotundifolium* は各地で普通に生育していたが、*A. kirghistanicum* はキルギスキー山脈・スーサンミール山群でのみ見られた。Ser. Rotundifolia は非合法名であったのでラテン語の記載を与え、さらに新節 Sect. Rotundifolia とした。Sect. Rotundifolia は *A. kirghistanicum* と *A. rotundifolium*, *A. naviculare* から成る。イイデトリカブト *A. iudemontanum* は同じく2倍体種のサンヨウブシ *A. sanyoense* に似ているが、花梗に開出毛が生えること、円筒状の僧帽形で嘴の短い上萼片をもつことで後者とはっきり区別できる。イイデトリカブトは東北地方南部・飯豊山地の山形県側でしか見つかっていない。ワガトリカブト *A. okuyamae* var. *wagaense* は秋田県・羽後朝日岳の山頂付近の草原に生育する植物で、基本変種のウゼ

ントリカブトとは全体が小型で、茎が直立し、花数の少ないコンパクトな総状花序をつけ、茎葉の質が厚い点で異なる。こうした形質は日本産4倍体種では風衝草原など陽地に生育する形に一般的に見られるものであるが、ウゼントリカブトでは分

布域の全体を見渡してもこのような陽地型は羽後朝日岳の山頂部にしか出現しないため、ここで新変種として記載した。

(国立科学博物館植物研究部)